CLAIMS

Therefore, having thus described the invention, at least the following is claimed:

1   1.   A method for manipulating a graphical display, the method comprising the

2   steps of:

3   providing a graphical user interface comprising a first portion for providing a

4   graphical display, the graphical display comprising a plurality of image objects;

5   receiving a user selection of a first image object in the first portion of the

6   graphical user interface;

7   displaying a target area containing the first image object selected;

8   receiving a user selection of a second image object in the first portion of the

9   graphical user interface; and

10   modifying the displayed target area such that the target area contains the first
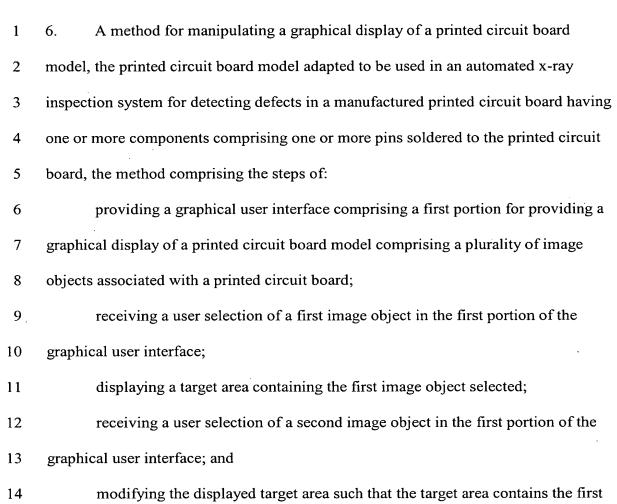
11   and second image objects.

1   2.   The method of claim 1, wherein the step of modifying the displayed target area

2   comprises centering the target area with respect to the first and second image objects

3   selected.

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1   3.   The method of claim 1, wherein the step of modifying the displayed target area

2   comprises displaying the target area such that the first and second image objects are

3   contained within the target area and a maximum number of the image objects not

4   selected are contained in the target area.

1   4.   The method of claim 1, wherein the target area comprises a square.

1   5.   The method of claim 1, wherein the step of receiving a user selection of a first

2   image object and the step of receiving a user selection of a second image object is via

3   a cursor manipulated by a mouse.

1   6.   A method for manipulating a graphical display of a printed circuit board

2   model, the printed circuit board model adapted to be used in an automated x-ray

3   inspection system for detecting defects in a manufactured printed circuit board having

4   one or more components comprising one or more pins soldered to the printed circuit

5   board, the method comprising the steps of:

6   providing a graphical user interface comprising a first portion for providing a

7   graphical display of a printed circuit board model comprising a plurality of image

8   objects associated with a printed circuit board;

9   receiving a user selection of a first image object in the first portion of the

10   graphical user interface;

11   displaying a target area containing the first image object selected;

12   receiving a user selection of a second image object in the first portion of the

13   graphical user interface; and

14   modifying the displayed target area such that the target area contains the first

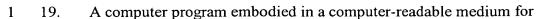15   and second image objects.

1   7.   The method of claim 6, wherein the step of modifying the displayed target area

2   comprises centering the target area with respect to the first and second image objects

3   selected.

1   8.   The method of claim 6, wherein the step of modifying the displayed target area

2   comprises displaying the target area such that the first and second image objects are

3   contained within the target area and a maximum number of the image objects not

4   selected are contained in the target area.

1   9.   The method of claim 6, wherein at least one of the plurality of image objects

2   comprises a family object that specifies a type of solder joint.

1   10.   The method of claim 6, wherein at least one of the plurality of image objects

2   comprises a package object that specifies a type of component.

1   11.   The method of claim 6, wherein at least one of the plurality of image objects

2   comprises a pin object that specifies a unique pin number for a specific component in

3   the printed circuit board.

1   12.   The method of claim 6, wherein the target area comprises a square.

1   13.   The method of claim 6, wherein the step of receiving a user selection of a first

2   image object and the step of receiving a user selection of a second image object is via

3   a cursor manipulated by a mouse.

1   14.   A computer program embodied in a computer-readable medium for

2   manipulating a graphical display, the computer program comprising logic configured

3   to:

4   provide a graphical user interface comprising a first portion for providing a

5   graphical display, the graphical display comprising a plurality of image objects;

6   receive a user selection of a first image object in the first portion of the

7   graphical user interface;

8   display a target area containing the first image object selected;

9   receive a user selection of a second image object in the first portion of the

10   graphical user interface; and

11   modify the displayed target area such that the target area contains the first and

12   second image objects.

1   15.   The computer program of claim 14, wherein the logic is further configured to

2   modify the displayed target area by centering the target area with respect to the first

3   and second image objects selected.

1   16.   The computer program of claim 14, wherein the logic is further configured to

2   modify the displayed target area by displaying the target area such that the first and

3   second image objects are contained within the target area and a maximum number of

4   the image objects not selected are contained in the target area.

1   17.   The computer program of claim 14, wherein the target area comprises a

2   square.

1   18.   The computer program of claim 14, wherein the logic is further configured to

2   receive the user selection of a first image object and a second image object via a

3   cursor manipulated by a mouse.

1   19.   A computer program embodied in a computer-readable medium for

2   manipulating a graphical display of a printed circuit board model, the printed circuit

3   board model adapted to be used in an automated x-ray inspection system for detecting

4   defects in a manufactured printed circuit board having one or more components

5   comprising one or more pins soldered to the printed circuit board, the computer

6   program comprising logic configured to:

7   provide a graphical user interface comprising a first portion for providing a

8   graphical display of a printed circuit board model comprising a plurality of image

9   objects associated with a printed circuit board;

10   receive a user selection of a first image object in the first portion of the

11   graphical user interface;

12   display a target area containing the first image object selected;

13   receive a user selection of a second image object in the first portion of the

14   graphical user interface; and

15   modify the displayed target area such that the target area contains the first and

16   second image objects.

1   20.   The computer program of claim 19, wherein the logic is further configured to

2   modify the displayed target area by centering the target area with respect to the first

3   and second image objects selected.

1   21.   The computer program of claim 19, wherein the logic is further configured to

2   modify the displayed target area by displaying the target area such that the first and

3   second image objects are contained within the target area and a maximum number of

4   the image objects not selected are contained in the target area.

1   22.   The computer program of claim 19, wherein at least one of the plurality of

2   image objects corresponds to a solder joint.

1   23.   The computer program of claim 19, wherein at least one of the plurality of

2   image objects corresponds to a component.

1   24.   The computer program of claim 19, wherein at least one of the plurality of

2   image objects corresponds to a pin.

1   25.   The computer program of claim 20, wherein the target area comprises a

2   square.

1   26.   The computer program of claim 19, wherein the logic is further configured to

2   receive the user selection of a first image object a second image via a cursor

3   manipulated by a mouse.

1   27.   A system for manipulating a graphical display of a printed circuit board model,

2   the printed circuit board model adapted to be used in an automated x-ray inspection

3   system for detecting defects in a manufactured printed circuit board having one or

4   more components comprising one or more pins soldered to the printed circuit board,

5   the system comprising:

6   a means for providing a graphical user interface comprising a first portion for

7   providing a graphical display of a printed circuit board model comprising a plurality

8   of image objects associated with a printed circuit board;

9   a means for receiving a user selection of one or more of the image objects in

10   the first portion of the graphical user interface; and

11   a means for displaying a target area such that the target area contains one or

12   more image objects selected and a maximum number of the image objects not selected

13   are contained in the target area.

1   28.   A system for manipulating a graphical display of a printed circuit board model,

2   the printed circuit board model adapted to be used in an automated x-ray inspection

3   system for detecting defects in a manufactured printed circuit board having one or

4   more components comprising one or more pins soldered to the printed circuit board,

5   the system comprising:

6   logic configured to:

7   provide a graphical user interface comprising a first portion for

8   providing a graphical display of a printed circuit board model comprising a

9   plurality of image objects associated with a printed circuit board;

10   receive a user selection of a first image object in the first portion of the

11   graphical user interface;

12   display a target area containing the first image object selected;

13   receive a user selection of a second image object in the first portion of

14   the graphical user interface; and

15   modify the displayed target area such that the target area contains the

16   first and second image objects;

17   a processing device configured to implement the logic; and

18   a display device configured to support the graphical user interface

1   29.   The system of claim 28, wherein the logic is further configured to modify the

2   displayed target area by centering the target area with respect to the first and second

3   image objects selected.

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1   30.   The system of claim 28, wherein the logic is further configured to modify the

2   displayed target area by displaying the target area such that the first and second image

3   objects are contained within the target area and a maximum number of the image

4   objects not selected are contained in the target area.

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1   31.   The system of claim 28, wherein at least one of the plurality of image objects

2   corresponds to a solder joint.

1   32.   The system of claim 28, wherein at least one of the plurality of image objects

2   corresponds to a component.

1   33.   The system of claim 28, wherein at least one of the plurality of image objects

2   corresponds to a pin.

1   34.   The system of claim 29, wherein the target area comprises a square.

1   35.   The system of claim 28, wherein the logic is further configured to receive the

2   user selection of a first image object a second image via a cursor manipulated by a

3   mouse.